3.0 Affected Environment

This section describes the natural and human environment that could be affected by the Proposed Action, the General Public Trails Closure Alternative, and the No Action Alternative. The potential environmental consequences of those actions are presented in Section 4. Environmental issues are identified and addressed based on the "Sliding Scale Approach" discussed earlier in this EA (Subsection 1.4). Table 2 identifies the subsections in Sections 3 and 4 where potential environmental issues are discussed and notes those issues that are not affected by the Proposed Action.

Table 2. Potential Environmental Issues

Environmental Category	Applicability	Subsections
Socioeconomics	Yes	3.1, 4.1
Ecological Resources (biological resources and wetlands)	Yes	3.2, 4.2
Cultural Resources	Yes	3.3, 4.3
Water Quality	Yes	3.4, 4.4
Environmental Restoration	Yes	3.5, 4.5
Transportation, Traffic, and Infrastructure	Yes	3.6, 4.6
Health and Safety	Yes	3.7, 4.7
Environmental Justice	Yes	3.8, 4.8
Geology and Soils	Yes	3.9, 4.9
Waste Management	Yes	3.10, 4.10
Air Quality	Yes	3.11, 4.11
Noise	Yes	3.12, 4.12
Visual Resources	The Proposed Action, the Trails Closure Alternative, and the No Action Alternative would not affect visual resources.	NA
Land Use	The Proposed Action, the Trails Closure Alternative, and the No Action Alternative would not alter current land use designations at LANL.	NA

The Proposed Action would be implemented within the area of Los Alamos County that includes LANL. LANL comprises a large portion of Los Alamos County and extends into Santa Fe County. LANL is situated on the Pajarito Plateau along the eastern flank of the Jemez Mountains and consists of 49 technical areas spread out over 40 mi^2 (104 km^2). The Pajarito Plateau slopes downward towards the Rio Grande along the eastern edge of LANL and contains several fingerlike mesa tops separated by relatively narrow and deep canyons that are prone to flooding.

Commercial and residential development in Los Alamos County is confined primarily to several mesa tops lying north of the core LANL development, in the case of the Los Alamos town site, or southeast, in the case of the communities of White Rock and Pajarito Acres. Approximately 12 percent of the land in Los Alamos County is privately held. The lands surrounding Los Alamos County are largely undeveloped wooded areas with large tracts located to the north, west, and south of LANL that are administered by the Department of Agriculture, Santa Fe National Forest, and by the U.S. Department of the Interior (DOI), National Park Service, Bandelier National Monument. Lands to the east of LANL are administered by the DOI, Bureau of Land Management or San Ildefonso Pueblo.

Detailed descriptions of LANL's natural resources environment, cultural resources, socioeconomic, waste management, regulatory compliance record, and general operations are described in detail in the SWEIS (DOE 1999a). Additional information is available in the most recent annual Environmental Surveillance Report (LANL 2001a) and the *Special Environmental Analysis for the Department of Energy, National Nuclear Security Administration, Actions taken in Response to the Cerro Grande Fire at Los Alamos National Laboratory, Los Alamos, New Mexico* (DOE 2000a). These documents are available at the Public Reading Room at 1619 Central Avenue, Los Alamos, New Mexico.

3.1 Socioeconomics

About 20,000 people live in Los Alamos County and another 6,000 or so commute to work there. Bandelier National Monument had nearly 300,000 visitors in 2002. Tourism in Los Alamos County, although not a major component of the local economy, is nonetheless very important to businesses that derive trade from it. Outdoor recreation is a significant component of tourism activity in Los Alamos County and adjacent counties. Trail access contributes in other ways to the local economy through contribution to overall quality of place. Outdoor recreational opportunity is an important component of what makes living in Los Alamos attractive to prospective residents and employees of LANL and other employers. The Los Alamos area is home to several active volunteer search and rescue teams that provide important emergency services throughout the state. Canine search teams, equestrian mounted search personnel, communications, high angle rescue and medical teams contribute to the overall safety and security of state citizens. These teams and groups use LANL area trails for training and testing purposes. Several hundred miles of trails and unimproved roads traverse the Jemez Mountains, of which the Pajarito Plateau is a small part. The new Valles Caldera National Preserve will also draw visitors from the region and the nation.

LANL and Los Alamos County operations have a notable and positive influence on the economy of north-central New Mexico. Specifically, in FY01 (the latest year for which such information is available) LANL had an operating budget that was $1.667 billion and a total workforce of 13,570. Salaries and benefits accounted for $880 million. This translated into a $3.8 billion impact on the tri-county region that includes Los Alamos, Santa Fe, and Rio Arriba Counties. In effect, nearly one of every three jobs in the tri-county region was created or supported by LANL FY01 procurements in northern New Mexico which were $357 million (LANL 2002). Approximately 80 percent of the jobs created indirectly by LANL in the region occurred in the trade, finance, insurance, real estate, and services sectors (DOE 1999a). The FY03 budget for Los Alamos County proposed $205.5 million in expenditures, predominantly for operations and labor costs (LAC 2003).

One of the beneficial results of being home to LANL is that Los Alamos County has one of the highest median household incomes in the nation at $78,993 according to the 2000 Census. Families living below the poverty level in Los Alamos County accounted for just 1.9 percent of all families. This compares with a median household income of $34,133 for the State of New Mexico, which has 14.5 percent of all families living below the poverty level (USCB 2000a). Nearly 95 percent of a total of 7,937 housing units were occupied in Los Alamos County, and 79 percent of the total units were owner-occupied. The rental vacancy rate was about 11 percent as reported in the 2000 Census (USCB 2000b).

3.2 Ecological Resources

Biological resources include all plants and animals, with special emphasis on Federally listed threatened and endangered species protected by the ESA (16 USC 1531), and floodplains and wetlands. The Los Alamos region is biologically diverse. This diversity is due partly to the pronounced 5,000-ft (1,500-m) elevation gradient from the Rio Grande to the Jemez Mountains and partly to the many canyons that dissect the region. Five major vegetation cover types are found within LANL: juniper (*Juniperus monosperma* [Engelm.] Sarg.) savannas; piñon (*Pinus edulis* Engelm.) juniper woodlands; ponderosa pine (*Pinus ponderosa* P. & C. Lawson) forests, mixed conifer forests (Douglas fir [*Pseudotsuga menziesii* (Mirbel) Franco] ponderosa pine, white fir [*Abies concolor* (Gord. & Glend.) Lindl. ex Hildebr.], and grasslands. In addition, wetlands and riparian areas enrich the diversity of plant and animal life at LANL. The majority of the wetlands in the LANL region are associated with canyon stream channels or are present on mountains or mesas as isolated meadows often in association with springs or seeps. There are also some springs within White Rock Canyon.

Plant communities range from urban and suburban areas to grasslands, wetlands, shrubland, woodland, and mountain forest and provide habitat for a variety of animal life. Animal life includes herds of elk (*Cervus elaphus*) and deer (*Odocoileus hemionus)*, bear (*Ursus americanus)*, mountain lions (*Puma concolor)*, coyotes (*Canis latrans*), rodents, numerous species of bats, reptiles, amphibians, invertebrates, and a myriad of resident, seasonal, and migratory birds. In addition, Federally listed threatened and endangered species occur at LANL. Because of restricted access to certain LANL areas, lack of permitted hunting, and management of contiguous Bandelier National Monument and Forest Service lands for natural biological systems, much of the region functions as a refuge for wildlife.

The juniper savanna community type is found along the Rio Grande and extends upward on the south-facing sides of canyons at elevations between 6,200 and 5,200 ft (1,860 and 1,560 m). The piñon-juniper cover type occupies large portions of the mesa surfaces in the 6,000- to 6,200-ft (2,070- to 1,860-m) elevation range, as well as north-facing slopes at lower elevations. The piñon-juniper woodland community type is the dominant vegetation type of both the Pajarito Plateau and the Caja del Rio Plateau. Ponderosa pine forests are found in the western portion of the Pajarito Plateau in the 7,500- to 6,900- ft (2,250- to 2,070-m) elevation range.

Conifer forest mixed with aspen forest, at an elevation of 9,500 to 7,500 ft (2,850 to 2,250 m), intermix with the ponderosa pine forests in the deeper canyons and on the north slopes and extend from the higher mesas onto the slopes of the Jemez Mountains. Grasslands occur in the western and central region at LANL, generally in areas that have been previously burned or disturbed.

Wetlands are transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. More than 95 percent of the identified wetlands at LANL are located in watersheds of the Sandia, Mortandad, Pajarito, and Water Canyons (DOE 1999c). Wetlands in the general LANL region provide habitat for reptiles, amphibians, and invertebrates (such as insects). Wetlands also provide habitat, food, and water for many common species such as deer, elk, small mammals, and many migratory birds and bats.

3.3 Cultural Resources

Cultural resources include any prehistoric sites, buildings, structures, districts, or other places or objects considered to be important to a culture or community for scientific, traditional, religious, or any other reason. They combine to form the human legacy for a particular place (DOE 1999a). To date, more than 2,000 archaeological sites and historic properties have been recorded at LANL.

The criteria used for evaluating cultural resources depends upon their significance as sites eligible for listing to the NRHP as described in the NHPA (16 USC 470). These determinations of significance are met by evaluating each cultural resource based on it meeting any one or more of the following criteria:

Criterion A association with events that have made a significant contribution to the broad pattern of our history;

Criterion B association with the lives of persons significant in our past;

Criterion C illustration of a type, period, or method of construction; for its aesthetic values or for its representation of the work of a master; or if it represents a significant and distinguished entity whose components may lack individual distinction; and

Criterion D it has yielded, or may be likely to yield, information important in prehistory or history.

Prehistoric resources at LANL refer to any material remains and items used or modified by people before the establishment of a European presence in the upper Rio Grande Valley in the early seventeenth century. Archaeological surveys have been conducted of approximately 90 percent of the land within LANL (with 85 percent of the area surveyed receiving 100 percent coverage) to identify the cultural resources. The majority of these surveys emphasized prehistoric Native American archaeological sites, including Pueblos, rock shelters, rock art, water control features, trails, and game traps. A total of 1,777 prehistoric sites have been recorded at LANL, of which 439 have been assessed for potential nomination to the NRHP. Of these, 379 sites were determined to be eligible, 60 sites ineligible, and two of undetermined status. The remaining 1,338 sites, which have not been assessed for nomination to the NRHP, are protected as eligible sites until assessed and their actual status is determined.

The Cerro Grande Fire directly affected 215 prehistoric sites. Effects to cultural resource sites included effects originating from burned-out tree root systems forming conduits for modern debris and water to mix with subsurface archaeological deposits and for entry by burrowing animals. Also, snags or dead or dying trees have fallen and uprooted artifacts (DOE 1999a). Areas at LANL burned by the Cerro Grande Fire have been surveyed for effects and mitigation measures have been implemented.

Historic resources present within LANL boundaries and on the Pajarito Plateau can be attributed to nine locally defined Periods: U.S. Territorial, Statehood, Homestead, Post Homestead, Historic Pueblo, Undetermined historic, Manhattan Project, Early Cold War, and Late Cold War. A total of 706 historic sites have been identified at LANL.

The Cerro Grande Fire directly affected 11 historic buildings and 56 historic sites. Structures and artifacts from the Homestead Period, Manhattan Project Period, and Cold War Period were adversely affected. The fire destroyed virtually all of the wooden buildings associated with the

Homestead Period, and the burned properties were largely reduced to rubble. V-Site, one of the last vestiges of the Manhattan Project Period remaining at Los Alamos, was the location where work was conducted on the Trinity device. This important historical site was partially destroyed by the fire (DOE 2000a).

3.4 Water Quality

Surface water at LANL occurs primarily as short-lived or intermittent reaches of streams. Perennial springs on the flanks of the Jemez Mountains supply base flow into the upper reaches of some canyons, but the volume is insufficient to maintain surface flows across LANL. Runoff from heavy thunderstorms or heavy snowmelt can reach the Rio Grande. Effluents from sanitary sewage, industrial water treatment plants, and cooling tower blow-down enter some canyons at rates sufficient to maintain surface flows for varying distances (DOE 1999a). Surface waters at LANL are monitored by LANL and the New Mexico Environment Department (NMED) to survey the environmental effects of LANL operations. Planned releases from industrial and sanitary wastewater facilities within LANL boundaries are controlled by NPDES permits.

Data and analysis of LANL surface and groundwater quality samples taken from test wells indicate that LANL operations and activities have affected the surface water within LANL boundaries and some of the alluvial and intermediate perched zones in the LANL region. Details on the surface and groundwater quality can be found in the annual LANL Environmental Surveillance Report (LANL 2001a).

3.5 Environmental Restoration

DOE and LANL are jointly responsible for implementing the DOE Environmental Restoration (ER) Project at LANL. The ER Project is governed primarily by the corrective action process prescribed in the *Resource Conservation and Recovery Act* (RCRA), but it is also subject to LANL policies and to other applicable laws and regulations. The NMED administers RCRA in New Mexico. DOE, through the Los Alamos Site Office, conducts site characterization and waste cleanup (corrective action) activities at PRSs at LANL. Site characterization and cleanup are needed to reduce risk to human health and the environment posed by potential releases of contaminants at ER Project sites.

PRSs at LANL include septic tanks and lines, chemical storage areas, wastewater outfalls (the area below a pipe that drains wastewater), material disposal areas (landfills), incinerators, firing ranges and their impact areas, surface spills, and electric transformers. PRSs are found on mesa tops, in material disposal areas, in canyons, and in a few areas in the Los Alamos town site.

The primary means of contaminant release from these sites are surface water runoff carrying potentially contaminated sediments and soil erosion exposing buried contaminants. The main pathways by which released contaminants can migrate are infiltration into alluvial aquifers, airborne dispersion of particulate matter, and sediment migration from surface runoff. The contaminants involved include volatile organic compounds, semivolatile organic compounds, polychlorinated biphenyls, asbestos, pesticides, heavy metals, beryllium, radionuclides, petroleum products, and high explosives (HE). The 1999 LANL SWEIS (DOE 1999a) contains additional information on contaminants.

3.6 Transportation, Traffic, and Infrastructure

LANL is situated on approximately 25,000 ac (10,000 ha) of land administered by NNSA. Only about 30 percent of this land is developable and suitable for research and development and office facilities, because of topographic, environmental, operational, and buffering constraints. Utility systems at LANL include electrical service, natural gas, telecommunications, steam, water, sanitary sewer, and a radioactive liquid waste system. Section 4.10 of the 1999 LANL SWEIS (DOE 1999a) describes transportation services at LANL. The impacts on transportation in and around LANL under the Preferred Alternative selected in the SWEIS ROD are described in detail in Section 5.3.10 of the SWEIS. Regional and site transportation routes including East and West Jemez Roads, Pajarito Road, and SR 4, are the primary conduits used to transport LANL-affiliated employees, commercial shipments, and hazardous and radioactive material shipments. There are sidewalks in the more developed LANL technical areas and walkways and pathways that link technical areas to one another. Some LANL workers and visitors use the network of social trails to travel to and from the town site and between LANL technical areas. Bladed (unpaved) fire roads are located in many areas of LANL and some are used as walking paths and access roads for maintaining utility services. Some trails begin at, follow, or intersect vehicle transportation routes and utility corridors. However, users of LANL trails sometimes park vehicles adjacent to trail entrances and alongside roads. These areas have typically not been designed for parking and are not improved parking sites.

3.7 Health and Safety

The health and safety setting for trail maintenance workers and users at LANL can vary depending upon the condition and location of each trail. Some of LANL's trails traverse remote and undeveloped locations that pose particular human health and safety risks. There are risks associated with human encounters with wildlife and physical hazards such as steep slopes, falling tree limbs, rockslides, and inclement weather conditions. These factors could affect trail maintenance workers and recreational users. In addition, there are potential chemical and radiological hazards from PRSs and radiological or HE operations at LANL. PRSs may contain hazardous materials, HE, and radioactive materials in small amounts that pose minimal threats to trail users. Hazardous operations occur across LANL and in proximity to some trails. These operations could pose radiation, chemical, and explosive hazards to trail users. Areas with operational hazards and human health and exposure risks are generally marked with signs, are announced through sirens or other alerts, or are conducted in security areas with restricted access and barriers.

Workers involved in trail development and maintenance are generally considered to be in good health. They also receive training in emergency preparedness and response and the proper use of hazardous equipment in outdoor settings. Trail users would generally be people that are also in good health and knowledgeable about potential outdoor hazards but may not be familiar with LANL operational hazards.

3.8 Environmental Justice

Presidential Executive Order 12898 (EO 12898) requires that Federal agencies consider environmental justice when complying with NEPA. Environmental justice is concerned with possible disproportionately adverse health and socioeconomic effects of proposed Federal actions on minority and low-income populations. Communities with people of color, exclusive

of white non-Hispanics, and low-income households earning less than $15,000 per year, must be identified and considered by DOE when preparing an EA. About 54 percent of the population is of minority status within a 50-mi (80-km) radius of LANL while 24 percent of the households have annual incomes below $15,000. The New Mexico median household income in 2000 was $34,133 (USCB 2000a). Los Alamos County has a higher median family income and a much lower percentage of minority residents than the four surrounding counties, being approximately 18 percent minority (the percentage of non-whites, including Hispanics, defined by the US Census) and having a median household money income of $78,993 (USCB 2000b).

The Pueblo of San Ildefonso is adjacent to Los Alamos County and LANL and meets the environmental justice criteria for minority (Native American) populations; however, the median household income was $30,457 in 2000, while 12.4 percent of the families at the Pueblo were below the poverty level. The three other nearby Accord Pueblos of Santa Clara, Cochiti, and Jemez have median household incomes of $30,946, $35,500, and $28,889, respectively, and 16.4 percent, 13.2 percent, and 27.2 percent, respectively, of the families live below the poverty level at these three Pueblos. Pojoaque Pueblo, also located near LANL, has a median household income of $34,256, and 11.3 percent of families there live below the poverty level (USCB 2000c).

3.9 Soils and Geology

Several distinct soil types have developed at LANL as a result of interaction between the bedrock, topography, and local climate. Mesa-top soils on the Pajarito Plateau include series that are well drained and range from very shallow 0 to 1 inch (in.) (0 to 25 centimeters [cm]) to moderately deep 2 to 4 in. (51 to 102 cm). The geochemistry, geomorphology, and formation of soils at LANL have been characterized and surveyed. Soil erosion rates vary considerably on the mesa tops at LANL, with the highest rates occurring in drainage channels and areas of steep slopes. The lowest rates tend to occur on gently sloping portions of the mesa tops away from channels. Studies at Bandelier National Monument indicate that erosion rates are high across widespread portions of local piñon-juniper woodlands that predominate in the eastern areas of LANL. Areas where runoff is concentrated by roads and other structures (such as trails if they aren't properly located, constructed, and maintained) are especially prone to high erosion rates. Even light summer rainstorms have resulted in erosion exceeding 12 tons (10.9 tons metric) per acre. Soil erosion can have serious consequences to the maintenance of biological communities and may also be a mechanism for moving contaminants across LANL and off site (DOE 1999a).

LANL is part of the Jemez Mountains volcanic field (JMVF) located at the intersection of the western margin of the Rio Grande Rift and the Jemez Lineament (Gardner et al. 1986, Heiken et al. 1996). The Jemez Lineament is a northeast-southwest-trending alignment of young volcanic fields ranging from the Springerville volcanic field in east-central Arizona to the Raton volcanic field of northeastern New Mexico (Heiken et al. 1996). The JMVF is the largest volcanic center along this lineament (LANL 1992). Volcanism in the JMVF spans a roughly 16-million-year period beginning with the eruptions of numerous basaltic lava flows. Various other eruptions of basaltic, rhyolitic, and intermediate composition lavas and ash flows occurred sporadically during the next 15 million years with volcanic activity culminating in the eruption of the rhyolitic Bandelier Tuff 1.79 and 1.23 million years ago (Self and Sykes 1996). Most of the bedrock on LANL property is composed of the salmon-colored Bandelier Tuff.

The geologic structure of the LANL area is dominated by the north-trending Pajarito Fault system. The Pajarito Fault system consists of three major fault zones (Pajarito, Guaje Mountain, and Rendija Canyon fault zones) and numerous secondary faults with vertical displacements ranging from 80 to 400 ft (24 to 120 m). Estimates of the timing of the most recent surface rupturing paleoearthquakes along this fault range from 3,000 to 24,000 years ago (LANL 2001b, 1999). Although large uncertainties exist, an earthquake with a Richter magnitude of 6 is estimated to occur once every 4,000 years; an earthquake of magnitude 7 is estimated to occur once every 100,000 years (DOE 1999a).

3.10 Waste Management

LANL generates solid waste[6] from construction, demolition, and facility operations. These wastes are managed and disposed of at appropriate solid waste facilities. Both LANL and Los Alamos County use the same solid waste landfill located within LANL boundaries. The Los Alamos County Landfill also accepts solid waste from other neighboring communities. The Los Alamos County Landfill receives about 52 tons per day (47 metric tons per day), with LANL contributing about 8 tons per day (7 metric tons per day), or about 15 percent of the total. The current Los Alamos County Landfill is scheduled to close in about 2007; the identification of a replacement disposal facility and other waste management options are currently being investigated.

Building debris storage yards on Sigma Mesa (TA-60) or other approved material management areas are used at LANL to store concrete rubble, soil, and asphalt debris for future use at LANL. Low-level radioactive waste is disposed of at LANL, TA-54, Area G, or is shipped offsite to appropriate permitted facilities. Hazardous waste[7] regulated under RCRA is transported to TA-54 at LANL for proper management, which is carried out in accordance with applicable laws, regulations, and DOE Orders. Hazardous wastes and mixed wastes both are treated and disposed of offsite since LANL has no onsite disposal capability for these waste types. The offsite disposal locations are located across the U.S. and are audited for regulatory compliance before being used for LANL waste disposal.

3.11 Air Quality

Air quality is a measure of the amount and distribution of potentially harmful pollutants in ambient air[8]. Air surveillance at Los Alamos includes monitoring emissions to determine the air quality effects of LANL operations. LANL staff calculates annual actual LANL emissions of regulated air pollutants and reports the results annually to the NMED. The ambient air quality in

[6] Solid waste, as defined in the Code of Federal Regulations (40 CFR 261.2) and in the New Mexico Administrative Code (20 NMAC 9.1), is any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities.

[7] Hazardous waste, as defined in 40 CFR 261.3, which addresses RCRA regulations, and by reference in 20 NMAC 4.1, is waste that meets any of the following criteria: a) waste exhibits *any* of the four characteristics of a hazardous waste: ignitability, corrosivity, reactivity, or toxicity; b) waste is specifically *listed* as being hazardous in one of the four tables in Subpart D of the Code of Federal Regulations; c) waste is a mixture of a *listed* hazardous waste item and a nonhazardous waste; d) waste has been *declared* to be hazardous by the generator.

[8] Ambient air is defined in 40 CFR 50.1 as "that portion of the atmosphere external to buildings, to which the public has access." It is defined in the New Mexico Administrative Code Title 20, chapter 2, part 72, as "the outdoor atmosphere, but does not include the area entirely within the boundaries of the industrial or manufacturing property within which the air contaminants are or may be emitted and public access is restricted within such boundaries."

and around LANL meets all U.S. Environmental Protection Agency (EPA) and DOE standards for protecting the public and workers (LANL 2001a).

LANL is a major source of air emissions (source that has the potential to emit more than 100 tons per year of certain nonradioactive substances) under the State of New Mexico Operating Permit program. Specifically, LANL is a major source of nitrogen oxides, emitted primarily from the TA-03 steam plant boilers. Combustion units are the primary point sources of criteria pollutants (nitrogen oxides, sulfur oxides, particulate matter, carbon monoxide, and volatile organic compounds) emitted at LANL.

Mobile sources, such as automobiles and construction vehicles, are additional sources of air emissions; however, mobile sources are not regulated by NMED. Diesel emissions from conveyance vehicles are not regulated as stationary sources of emissions. Mechanical equipment including bulldozers, excavators, backhoes, side booms, tamper compactors, trenchers, and drill rigs are exempt from permitting under Title 20 of the New Mexico Administrative Code Part 2.72, *Construction Permits*. This type of exemption does not require notification to NMED.

Both EPA and NMED regulate nonradioactive air emissions. NMED does not regulate dust from excavation or construction, but LANL employees take appropriate steps to control fugitive dust and particulate emissions during construction activities. Best Achievable Control Measures such as the use of water sprays or soil tacifiers are used to reduce fugitive dust emissions from cleared areas. Excavation and construction activities are not considered stationary sources of regulated air pollutants under the New Mexico air quality requirements; these activities are not subject to permitting under 20 NMAC, Parts 2.70 and 2.72. Annual dust emissions from daily windblown dust are generally higher than short-term, construction-related dust emissions. LANL would ensure that the New Mexico Ambient Air Quality Standards (NMAAQS) and the National Ambient Air Quality Standards (NAAQS) for particulate emissions are met throughout any construction activities.

3.12 Noise

Noise is defined as unwanted sound. Noise is categorized into two types: *continuous noise,* which is characterized as longer duration and lower intensity, such as a running motor, and *impulsive* or *impact noise,* which is characterized by short duration and high intensity, such as the detonation of HE. The intensity of sound is measured in decibel (dB) units and has been modified into an A-weighted frequency scale (dBA) for setting human auditory limits.

Noise measured at LANL is primarily from occupational exposures that generally take place inside buildings. Occupational exposures are compared against an established threshold limit value (TLV). The TLV is administratively defined as the sound level to which a worker may be exposed for a specific work period without probable adverse effects on hearing acuity. The TLV for continuous noise is 85 dBA for an 8-hour workday. The TLV for impulsive noise during an 8-hour workday is not fixed because the number of impulses allowed per day varies depending on the dBA of each impulse, however, no individual impulse should exceed 140 dBA. An action level (level of exposure to workplace noise that is below the TLV but the use of personal protective equipment is recommended) has been established for noise in the workplace at LANL. The action level for both continuous and impulsive noise is 82 dBA for an 8-hour workday.

Environmental noise levels at LANL are measured outside of buildings and away from routine operations. These sound levels are highly variable and are dependent on the generator. The

following are typical examples of sound levels (dBA) generated by barking dogs (58), sport events (74), nearby vehicle traffic (63), aircraft overhead (66), children playing (65), and birds chirping (54). Sources of environmental noise at LANL consist of background sound, vehicular traffic, routine operations, and periodic HE testing. Measurements of environmental noise in and around LANL facilities and operations average below 80 dBA.

The averages of measured values from limited ambient environmental sampling in Los Alamos County were found to be consistent with expected sound levels (55 dBA) for outdoors in residential areas. Background sound levels at the White Rock community ranged from 38 to 51 dBA (Burns 1995) and from 31 to 35 dBA at the entrance of Bandelier National Monument (Vigil 1995). The minimum and maximum values for the County ranged between 38 dBA and 96 dBA, respectively.